

(12) UK Patent Application

(19) GB

(11) 2 251 541

(13) A

(43) Date of A publication 15.07.1992

(21) Application No 9200128.8

(22) Date of filing 06.01.1992

(30) Priority data

(31) A00000291

(32) 08.01.1991

(33) IT

(51) INT CL^E
A23L 3/02 3/04(52) UK CL (Edition K)
A2D DPJ D2E1

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(71) Applicants

Ugo Campa
Via Salvo d'Aquisto N 26, Cologne -BS-, ItalyFrancesco Piluso
Via Sclaraffa n 9, Salerno, Italy

(72) Inventors

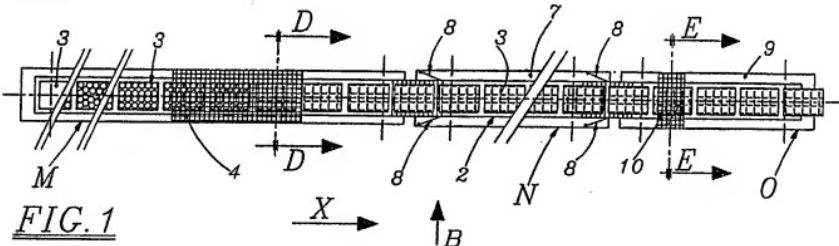
Ugo Campa
Francesco Piluso

(74) Agent and/or Address for Service

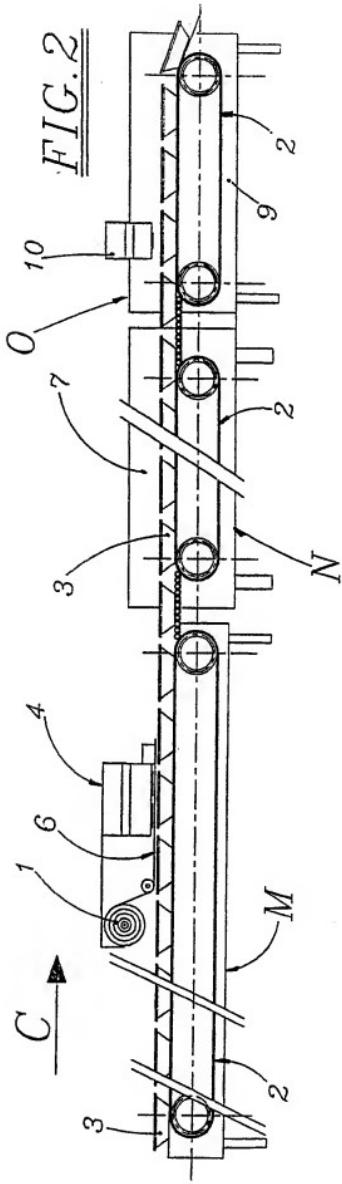
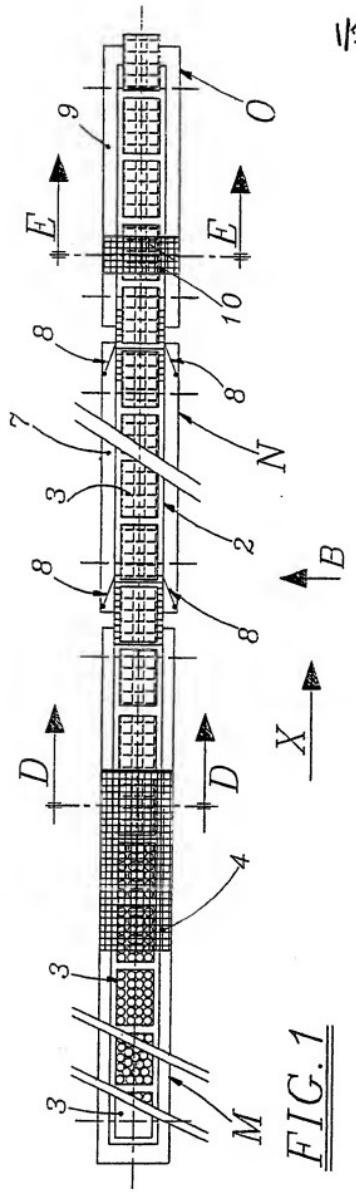
Sergeants
25 The Crescent, King Street, Leicester, LE1 6RX,
United Kingdom(58) Field of search
UK CL (Edition K) A2D DPJ DPK DPL
INT CL^E A23L

(54) Sterilizing food

(57) Apparatus and a process for preparing a container of food suitable for consumption or storage comprises a conveyor 2 for transporting trays 3 of food through a tunnel 7. The conveyor 2 passes through a loading sector M, a sterilizing sector N and a sealing, cooling and discharge sector O. In the loading sector M, there is a device 4 for welding an aluminium foil lid on each tray 3 leaving vents. In the sealing sector O, there is a device 10 in a second tunnel 9 for sealing the lid on each tray 3.

FIG. 1

GB 2 251 541 A



2/2

FIG. 3

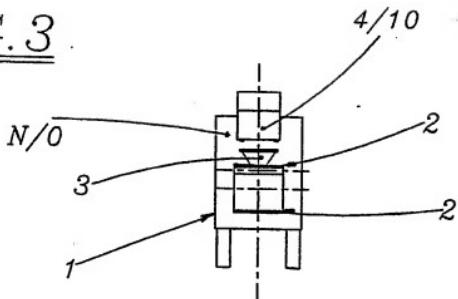


FIG. 4

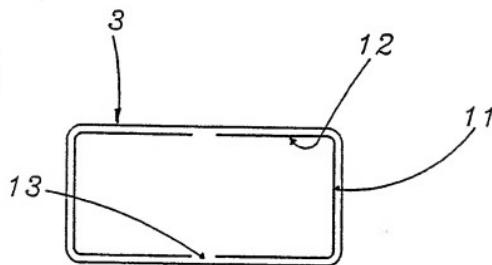
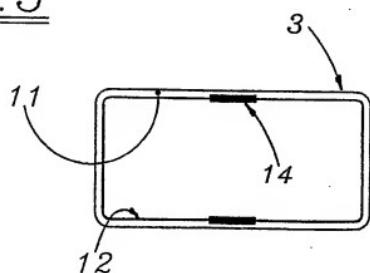


FIG. 5



TITLE

Sterilising Food

DESCRIPTION

The invention relates to apparatus and a process for preparing a container of food suitable for consumption in the short term or for storage in the long term. The invention can be performed with existing machines and packaging plants adapted for the purpose.

For the preparation of food and meals packed and sealed in containers, ready-to-eat or for long term storage, rules and regulations must be observed. These include sterilization, which is at present carried out by means of autoclaves, trays being loaded manually into the autoclave and unloaded manually. The same results are obtained nowadays using other systems and equipment, for example "microwave" equipment, but these call for considerable capital investment and energy consumption.

Apparatus according to the invention comprises a conveyor for transporting trays of food through a tunnel, means for sterilizing the food in the tunnel, and means for sealing a lid on each tray after sterilizing and before cooling. The invention includes a process which comprises loading a tray of food onto a conveyor, sterilizing the food on the conveyor, and sealing a lid on each tray after sterilizing and before cooling. All transfers of the trays can thus be eliminated.

Preferably the lid is welded on each tray before sterilizing, so the sealing is effected in two stages, before and after sterilization. This eliminates the possibility of the trays bursting open whilst being manoeuvred and conveyed to a point where they are suddenly brought up to a temperature of approximately 120°C and then suddenly cooled.

Advantageously, there is a conveyor in a loading sector, a conveyor in a sterilizing sector, and a conveyor in a

sealing, cooling and discharge sector which move the trays at the same speed as they are filled. The lids for the trays are preferably of an extremely thin metal foil which is placed on the trays and welded by an automatic device. Vent holes are left at the welding stage and sealed after cooling. Specially shaped lids can be fitted.

Drawings

Figure 1 is a schematic plan view of apparatus according to the invention;

Figure 2 is a corresponding side view from B;

Figure 3 is an end view from C in Figure 2 at section lines DD and EE in Figure 1;

Figure 4 shows where the welding is carried out which joins a lid to a tray, and the position of vent holes as made at section DD; and

Figure 5 shows where a second weld or sealing is effected, and the vent openings are closed as at section EE in Figure 1.

In Figures 1 and 2, the apparatus comprises a loading sector M, a sterilizing sector N, and a sealing, cooling and discharge sector O. A conveyor 2, generally in the form of a belt, conveys trays 3 in a direction X (Figure 1), suitably spaced, through the apparatus. The conveyor 2 transports trays 3 of food past a welding device 4 where a lid 6 of aluminium foil from a reel 1 is welded along a line 12 (Figure 4) to the tray 3, leaving two spaces or vents 13. The conveyor 2 then carries the trays 3 into a tunnel 7 where sterilizing is effected. After that, the conveyor 2 conveys the trays 3 into a second tunnel 9 which is provided with a device 10 for sealing the lids 6 on the now sterilized containers as indicated by the welds 14 in Figure 5. A bulkhead 8 is provided at the end of the tunnel 7 for heat

retention. In the second tunnel 9, after the sealing device 10, the sterilized and sealed containers are subjected to forced cooling prior to discharge from the apparatus.

The tunnel 7 is provided with heat sources (not shown) which maintain a constant temperature of 120°C. The sealing device 10 operates during a short stoppage of each tray 3. The heating is preferably by means of steam jets, and the residence time of a tray in the tunnel 7 about 30 minutes.

CLAIMS

1. Apparatus for preparing a container of food suitable for consumption or storage, which apparatus comprises a conveyor for transporting trays of food through a tunnel, means for sterilizing the food in the tunnel, and means for sealing a lid on each tray after sterilizing and before cooling.
2. Apparatus according to claim 1 which comprises a device for welding the lid on each tray before sterilizing.
3. Apparatus according to claim 1 or claim 2 in which the sealing means is arranged in a second tunnel.
4. Apparatus according to any preceding claim in which there is a conveyor in a loading sector, a conveyor in a sterilizing sector, and a conveyor in a sealing, cooling and discharge sector.
5. Apparatus for preparing a container of food as herein described with reference to the drawings.
6. A process of preparing a container of food suitable for consumption or storage which process comprises loading a tray of food onto a conveyor, sterilizing the food on the conveyor, and sealing a lid on each tray after sterilizing and before cooling.
7. A process according to claim 6 in which the lid is welded on each tray before sterilizing.
8. A process of preparing a container of food as herein described with reference to the drawings.
9. A container of food prepared in apparatus or a process according to any preceding claim.

Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

9200128.8

Relevant Technical fields		Search Examiner
(i) UK CI (Edition)	K	DPJ; DPK; DPL
(ii) Int CI (Edition 5)		A23L B J GARDNER
Databases (see over)		Date of Search
(i) UK Patent Office		
(ii) NONE		16.3.92

Documents considered relevant following a search in respect of claims

1 TO 19

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB A 2232056 (APV BAKER LTD) see whole document	1 to 4, 6,7 and 9 at least
X	GB 1155081 (P EISLER) see particularly page 6 lines 58 to 65	1 to 4, 6,7 and 9 at least
X	GB 752680 (BOHM AND BOHM) see particularly page 2 lines 55 to 72	1 to 4,6, 7 and 9 at least
X	GB 594874 (SANGSTER AND SANGSTER) see whole document	1 to 4,6, 7 and 9 at least
X	GB 594826 (SANGSTER AND SANGSTER) see whole document	1 to 4,6, 7 and 9 at least
X	GB 448572 (STURGES AND SOUTHWELL AND COMPANY LTD)	1 to 4,6, 7 and 9 at least

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

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